The Case for a Space-Based Digital Slitless-Prism Survey in the Near-Infrared

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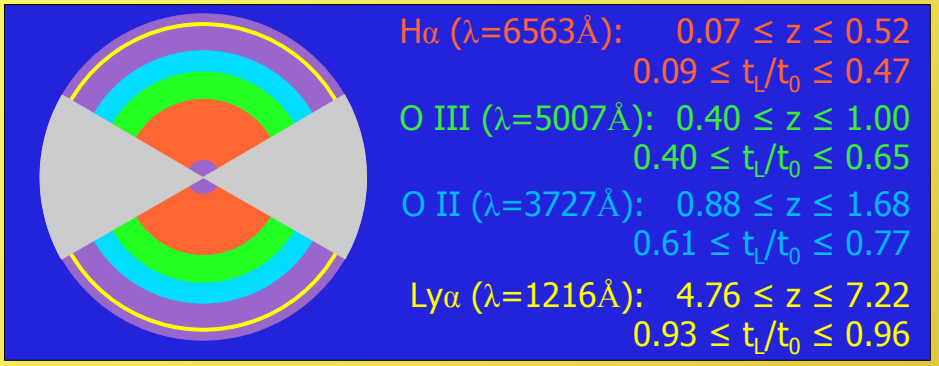
Advantages of a Slitless-Prism Survey

- A grism is placed in the light path before the detector, so each object creates a spectrum which can be analyzed.
- Since every object in the frame is analyzed spectroscopically, the survey completeness is better quantified.
- Unlike filtered imaging surveys, there is no need for a second observing run to obtain spectra, resulting in greater areal coverage for a given amount of telescope time.
- Using a wavelength range of 7,000 – 10,000 Å gives good coverage out to $z \approx 1.68$, with Lyα extending to $z \approx 7.22$.



Target Objects

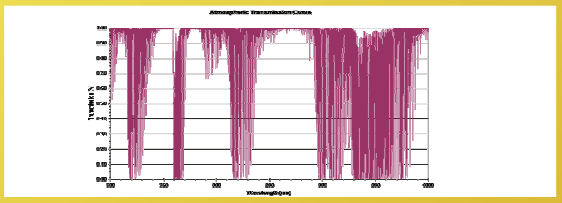
- Quasars
- Starburst Galaxies
- Seyfert Galaxies
- Active Galactic Nuclei
- H II Galaxies
- LINER Galaxies
- Emission-Line Stars
- Exotic Objects

Benefits of the Survey

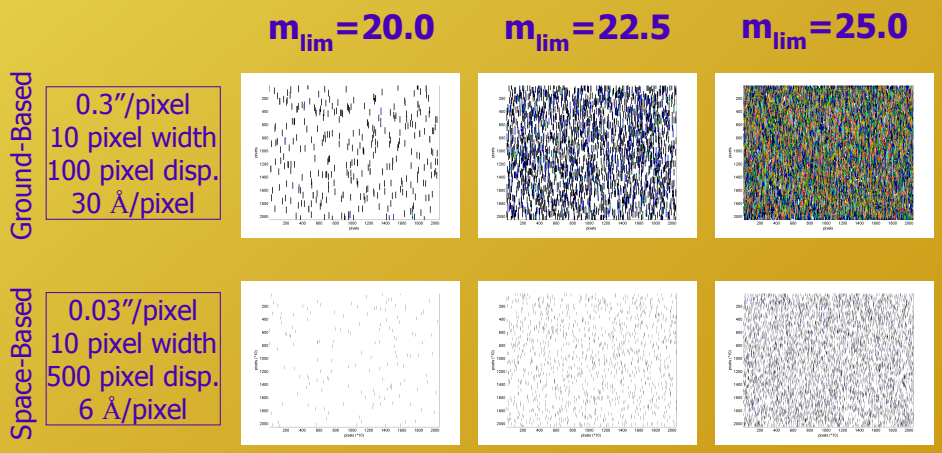
- Statistically reliable three-dimensional mapping of the universe.
- Large database of AGNs and ELGs as a function of z will allow us to better understand galaxy formation, structure, and evolution.

The Case for a Space-Based Survey

- Atmospheric Absorption – Water bands can significantly reduce the intensity of the spectra at certain wavelengths.



- Atmospheric Emission – Atmosphere radiates in the infrared which significantly lowers the signal-to-noise ratio.
- Frame Crowding – Spectra begin to overlap at fainter limiting magnitudes, creating problems with identification and analysis. This is lessened in a space-based survey.



Color represents the number of spectra contributing to the pixel:
Black=1, Blue=2, Green=3, Red=4, Yellow=5, Magenta=6, Cyan=7+

- Increased Spectral Resolution – Less crowding allows a significant increase in spectral resolution.

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